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Sustainable Development Strategy for Nova Scotia

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Environment and Economy
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Preface

In 1987 the National Task Force on Environment and Economy called on all provincial and territorial governments to develop conservation strategies by 1992. The Government of Nova Scotia responded by making a commitment in February 1990 to prepare a strategy: it is referred to as a sustainable development strategy. The Sustainable Development Subcommittee of the Nova Scotia Round Table on Environment and Economy was given this task and has developed this Sustainable Development Strategy.

The Subcommittee began by preparing a document titled "Environment, Economy and You." This document, which included a questionnaire, was forwarded to approximately 3500 Nova Scotians. The Subcommittee used the responses to this document combined with their own deliberations to prepare a Draft Sustainable Development Strategy. The draft strategy was discussed at eight public workshops throughout Nova Scotia. Comments received at these meetings and from written briefs were used when preparing the Sustainable Development Strategy. It was then approved by the Nova Scotia Round Table on Environment and Economy.

Persons who attended the public workshops and those that provided briefs are listed in Appendix I. The quotes that appear in this document came from those participants.

Part 1

A. The Vision—A Healthy Environment and a Vigorous Economy

"Sustainable development is used in this strategy to mean: improving the quality of human life while living within the carrying capacity of supporting ecosystems."
World Conservation Strategy, 1980

In 1987, the United Nations Commission on Environment and Development (the Brundtland Commission) stressed the importance of sustainable development—the integration of economic development and environmental protection. The Brundtland Commission stated we must live off the interest, not the capital. Sustainable development recognizes our responsibility to provide future generations with a quality of life equal to or better than that which we now enjoy. Sustainable development requires conducting our affairs in a manner that integrates economic, ecological, and social goals.

Traditionally, economic development has proceeded with little understanding of or regard for environmental protection. However, serious environmental problems such as acid rain, desertification, deforestation, and hazardous wastes disposal have shown the need for concern and action. An economy that is healthy in the long term depends upon a healthy environment.

A condition of sustainable development is long-term healthy populations of all species. Therefore we must make provisions for all forms of life as we conduct our economic and socio-cultural affairs if sustainable development is to become a reality.

Achieving the vision of a healthy environment and a vigorous economy poses a number of environmental as well as economic challenges. We must recognize that businesses in Nova Scotia face intense and growing global competition; likewise many emerging environmental issues transcend provincial borders.

We must recognize the desire of Nova Scotians to become more self-reliant by increasing job opportunities and reducing unemployment rates.

We must recognize that achieving a healthy environment has its associated costs, but also presents numerous benefits in terms of new environmental industries, goods, and services.

Achieving sustainable development will require changes in the way we treat our environment and changes in the way we view our economy. There will be a period of transition for working people and their families. These changes must be carefully managed to ensure that those affected are given every opportunity to adjust and take advantage of the opportunities inherent in our vigorous economy and healthy environment.

B. Concepts

Carrying Capacity

The term "sustainable development" recognizes that natural resources are limited and hence that the ability of the biosphere to support life (carrying capacity) is also limited.

At present, wealthy western countries consume a significantly disproportionate share of the globe's natural resources relative to their populations.

It is in our own self-interest to reduce our consumption. However difficult and challenging, this will require that we all re-examine the attitude that maximizing material possessions is the most important measure of success and will require rather that emphasize our quality of life. This implies a re-evaluation of our aesthetic, recreational and cultural values.

"Let it begin with me."

Nonrenewable Resources and Sustainable Development

In a sustainable society, nonrenewable resources such as minerals, oil, and natural gas must be conserved and used efficiently in order to allow for possible development of substitutes before the resource is depleted.

Growth vs. Development

In the past two centuries we have developed an economy dependent on continued growth for its stability. Sustainable development will require society to make a fundamental attitudinal change as we become aware of the emerging need to address the conflict inherent in an economic system that has promoted an ever-expanding consumption of resources within a world system of finite resources. This adaptation argues for a shift from an emphasis on growth (an

"We need people who love Cape Breton Island to help develop it."

expansion in the scale of the physical dimensions of the economic system) to an emphasis on development (adaptation and improvement in knowledge, organization, and technical efficiency) Within this context, sustainable development is viewed as a process in which qualitative development is maintained and prolonged while quantitative growth in the scale of the economy is increasingly determined by the capacity of the ecosystems to perform two essential functions: to regenerate the raw material inputs and to absorb the waste outputs of the human economy.

Efficiency

Efficiency (doing more with less) can contribute both to economic growth and a healthier environment.

Cumulative Effects

A single activity initiated by an individual or industry may not compromise the environment. However, multiple human activities, which can be small in and of themselves, collectively lead to significant adverse environmental impacts (cumulative effects). Managing cumulative effects is a prerequisite to moving toward sustainable development.

Cumulative effects can be positive when individuals take actions to reduce their impact on the environment.

C. The Historical Perspective

The Mi'kmaq of Nova Scotia relied heavily on nature both for food and for the materials of manufacture. A record of the Mi'kmaq's intimate relationship with the land is found in the Indian place names. Some refer to topography, such as Chedabucto (Sedabooktook) —"a bay running far back"— and Pugwash (Pagweak), "a bank of sand." Others refer to the resources of the land, like Shubenacadie (Segubunaakade) —"where nuts grow in abundance." Champlain recognized its richness when he named the region Acadie, meaning "a place of plenty."

In 1497 John Cabot reported that fish stocks in the Atlantic region were so abundant as to impede the progress of his vessel. European governments recognized that there were valuable resources in North America and began to exploit them in various ways, including by colonization. Exploitation of these marine resources has continued by both local and foreign harvesters right up to the present day.

Colonization soon led to the birth of an active agricultural industry in our province. The Acadians used dykeland technology to expand their cultivated acreage. This technology also led to the first artificially caused silt depositions in Nova Scotia. They also introduced their own plant and animal stocks, which broadened the resource base.

Both the early Aboriginal and European peoples used the forests to their advantage, as a source for building materials in the manufacture of homes and vessels. The latter use would in time create one of the region's largest industries as European settlers of many origins felled the forests to supply timber and ships to a world market.

Providing for the market would eventually have mixed blessings for Nova Scotia. While our region became a world-class ship-building and shipping power, fires resulting from human settlement and poor harvesting practices depleted our forests of the highest quality timber.

An endless European demand for wildlife for the fur trade and for provisions significantly reduced wildlife populations and changed the Mi'kmaq's attitudes toward wildlife. This changed attitude was mirrored in a breakdown of their once powerful and structured religion.

Economic wealth and societal change in the 19th and early 20th centuries have given Nova Scotians a very high per capita income compared to the rest of the world. In large measure this is a direct result of the income we derived from our natural resources.

In the last quarter of the present century, people from all walks of life have seriously begun to examine the effect that exploitative economic practices have had on our province's environment. This awareness promises to generate new practices and attitudes that may once again allow the description "a land of plenty" to be used by us and the generations that follow.

Sustainable development is an extension of our new awareness. It is a vehicle for moving away from ill-advised practices of the past to ones that will place us in harmony with the environment.

D. Principles for Sustainable Development

The Nova Scotia Sustainable Development Strategy is based upon seven principles: stewardship, ecological value, living off the interest, global implications and responsibility, full cost accounting, informed and accountable decision making, and scientific and technical innovation.

Stewardship

"The implementation of this strategy can only be successful if all Nova Scotians join the team."

Nova Scotians must take responsibility for the impacts our activities will have on this and future generations. We must ensure future generations have opportunity to achieve a quality of life equal to or greater than that which we now enjoy.

Ecological Value

"It's our world and we have to learn how to take care of it."

Nova Scotians must allow essential ecological processes, biological diversity, and the life support systems of our environment to flourish in as natural a manner as possible.

Living off the Interest

Nova Scotians must manage our activities so that our renewable resources are being utilized within their ability to replenish themselves, both in the short and long term.

"What we have here is incredible. What we have lost is incredible."

This principle requires that every attempt be made to
(a) reduce our consumption,
(b) reuse whenever possible, and
(c) recycle.

Nova Scotians must greatly improve efficiency in production, consumption, and delivery of goods and services. Increased efficiency will reduce demand for renewable and nonrenewable resources. In order to increase economic activity from the use of our limited resources, more emphasis should be placed on the value added to resources prior to export. Nova Scotians must reduce consumption of resources to the greatest extent possible.

Global Implications and Responsibility

Nova Scotians must think globally and act locally. This requires recognizing that there are no boundaries to our environment and that cooperation by all governments is needed.

Full Cost Accounting

"At present not all environmental costs have been factored in"

We are continuing to learn of the complexity and interrelatedness of our natural assets/resources and processes. No resource can be considered in isolation. It is important these resources be valued so that the cost to the user is a reasonable reflection of the benefits and costs to society. The value of our air and water resources must be included when determining total costs.

Informed and Accountable Decision Making

Government, industry, and individuals must incorporate environmental and economic considerations into decision-making processes. Opportunities for optimizing public input to government decision making and for access to sustainable development education are inherent in this principle. Individuals, businesses, governments, and labour must become informed about and involved in sustainable development issues and must be held accountable for decisions made.

Every attempt must be made to improve our understanding of the environment. This additional knowledge will greatly assist us in accurately predicting long-term impacts.

Scientific and Technological Innovation

Nova Scotia must research, develop, test, and market new efficient technologies and processes and shift to products and services that have minimum impact on the environment over their life cycles.

E. Education and Information

"We have to change attitudes at a grassroots level."

If the decisions that are made daily in our homes and offices, by people in all walks of life, are to be compatible with the goals of sustainable development, then all Nova Scotians will have to become better informed and educated on the costs and benefits of the choices we make every day.

Formal education, from elementary school through to university, should incorporate sustainable development education into all fields of study. It should also be offered through continuing education programs in the schools and training programs in the work place.

"Sustainable development education must be institutionalized if it is to be successful."

As many call this the turn-around decade and those involved in formal education programs will not be decision makers until the next decade, it is most important that non-formal education programs, including the daily media, are developed for adults.

Current consumer advertising encourages an increasingly wasteful and environmentally demanding lifestyle. A province-wide public information program should be developed and implemented to counteract this trend.

A comprehensive section on education can be found after the section on Human Settlements.

Part 2

Key Natural Resources

As all issues addressed by this document are interconnected, it is difficult to compartmentalize them. This document has been organized to address ecosystems (atmosphere, water, soil, and biological diversity) and economic sectors (wastes, agriculture, forestry, fishery and aquaculture, tourism and recreation, mining and minerals, energy and transportation, human settlements, and education).

All land-based activities have impacts on our air and water. Traditionally, the environmental implications of proposed projects were assessed on a project-by-project basis. Cumulative effects of individual actions such as energy use, use of pesticides, and improper maintenance of septic systems have not been adequately considered. It has become apparent that if we are to prevent negative cumulative effects we must examine our actions in the context of cumulative impacts.

Cumulative effects, whether negative or positive, only become apparent when looking at whole ecosystems. The most appropriate ecosystems on which to monitor and manage cumulative effects are watersheds. The Annapolis and Cornwallis rivers in the Annapolis Valley are examples of watercourses having deteriorated water quality caused by cumulative effects.

The Air

Traditionally, our air was considered in economic terms to be free, and it was not understood that our activities could have regional or global impacts. The result was a blatant disregard for this resource.

The atmosphere is being used as a dumping ground for a portion of our wastes. Considering the increasing global population, the spiralling demand by members of wealthy nations for goods and services, and the demands being made by economic expansion in developing countries, the global rate of atmospheric degradation continues to increase. This resource, which has evolved over billions of years, has been seriously degraded in the past 50 years.

The state of our atmosphere is the most obvious indicator that our actions cannot be considered in isolation--we do live in a global environment. Acid rain, ozone depletion, and global warming have shown the potential for regional or global impacts. Atmospheric pollution has advanced to the point where it is having impacts on the health of residents as well as on the environment.

There have been improvements to emission controls of late. New vehicle emission technology has greatly improved emissions from individual vehicles. However, the ever increasing number of vehicles on our roads has reduced the benefits of this new technology.

The following goals are proposed for sustainable use of our atmosphere:

Goal 1:

To ensure Nova Scotia makes a significant contribution to the reduction of pollutants that may threaten the essential life-supporting characteristics of the atmosphere.

Goal 2:

To improve the quality of point source emissions so as to meet environmental health standards and thus minimize localized impacts.

Some Recent or Current Initiatives:

Nova Scotia made a commitment to limit sulphur dioxide emissions (a contributor to acid rain) to 204 000 tonnes per year by 1994 as part of a 1988 Canada/Nova Scotia Agreement. Recently Nova Scotia committed to a further reduction to 189 000 tonnes per year.

Nova Scotia is presently taking part in federal/provincial negotiations on the NOx/VOC Reduction Program, the Global Warming/Greenhouse Gases Reduction Program, and the Ozone Depleting Substances Reduction Program.

The Ozone Layer Protection Act and the Ozone Layer Protection Regulations are now in force in Nova Scotia. They provide for the control of substances with the potential to contribute to ozone layer depletion.

The Minister's Task Force on Clean Air was formed in January 1991 to help develop a program to meet Nova Scotia's future air quality needs and to identify the role that governments, industry, institutions, and individuals in Nova Scotia can play in protecting and managing air resources at a local, national, and global level. The final report of the task force will be completed early in 1992. Given that the Sustainable Development Strategy is not a static document, the recommendations contained in this report will be reflected in future iterations of the strategy.

Proposed Initiatives:

1.1 Encourage the adoption of new technology for reducing carbon dioxide and sulphur dioxide emissions produced when burning coal. In addition, in cooperation with other provincial jurisdictions, develop methods for reducing greenhouse gas and other undesirable emissions through a system of offsetting credits, tradeable emission permits, or other similar means. (Also mentioned in the Energy and Transportation component)

1.2 Review new motor vehicle registration and tax schedules so that they encourage fuel efficiency. (Also mentioned in the Energy and Transportation component)

1.3 Develop power rate structures, including those for households, that encourage conservation. (Also mentioned in the Energy and Transportation component)

1.4 Establish industry performance standards for residential wood-burning devices and educate users regarding environmentally friendly burning techniques.

1.5 Reduce acid-precipitation-producing emissions to 169 000 tonnes by the year 1994. This additional reduction beyond the existing 189 000-tonne commitment will be attained by the implementation of efficiency and conservation measures.

1.6 Improve efficiency and increase conservation in the production and consumption of energy.

1.7 Require vehicle emissions testing on a regular basis.

1.8 Encourage reforestation as a means of removing carbon from the atmosphere.

The Water

Water is a fundamental mainstay of daily life. It is required for home use, commercial and industrial activities, and recreation, and to support plant and animal habitat. Although Nova Scotia is well endowed with lakes, rivers, streams, and wetlands, in many places the quality of water is poor, and periodic droughts are experienced. Some of the problems relate to natural environment factors but are often made worse by a combination of human activities. Most of the problem is derived from acid precipitation, silt, and inadequately treated sewage. These three in combination probably account for over 90 percent of the contamination in surface waters, but other pollutants are important in specific locations. In addition natural water clean-up and storage mechanisms are undermined by the destruction of wetlands, and flooding is enhanced by inappropriate construction on floodplains. To establish a sustainable balance in water management it will be important to ensure that healthy natural ecosystems are maintained, natural water systems are disturbed as little as possible, and pollutants are reduced. Consider the following facts:

- approximately 60 per cent of the population in Nova Scotia is serviced by public water systems.
- 16 municipal water systems in the province experience some problems with water quantity.
- 48 of the 56 surface water supplies contributing to municipal water systems have significant, identifiable water quality problems. (These problems include one or more of the following: excessive mineralization, odour, taste, corrosiveness, turbidity, bacteria.)
- 19 of the 25 groundwater supplies contributing to municipal water systems have significant, identifiable water quality problems.
- there are 35 licensed industrial users of surface water supplies in Nova Scotia and 9 licensed industrial users of groundwater systems.
- approximately 320,000 Nova Scotians have private wells providing their water needs.
- only 4 per cent of water utilized by households is for drinking and cooking.

Not all contaminants are hazardous to health, they may only make water unpleasant to drink or use. However some can undermine human health and adversely affect plant and animal life and a wide range of other water uses. Undesirable contaminants derived from natural sources include metals such as iron, manganese, arsenic, radon, various salts, and compounds from organic

decomposition. Human-derived contaminants, in addition to acid rain and sewage, include animal wastes and chemicals such as pest control products, industrial effluents, dry cleaning fluids, oil, and road salt. Sewage comes from both municipal systems and individual septic systems. Silt is a natural contaminant, but erosion from human activities such as forestry, agriculture, and land clearing and development can generate excessive amounts that degrade water quality.

It may be difficult or impossible to control natural pollutants, but it is certainly possible to minimize those generated by human activity. Every time this type of pollution occurs, it reduces the capacity of the resource to support human and animal life and economic growth and development. In addition, it may be very difficult or impossible to clean up problems once they have occurred.

In natural systems, runoff control and biological clean-up mechanisms for water are available in wetlands. They remove contaminants from storm water and provide surface water retention and groundwater recharge areas. In addition, wetlands provide habitat for native plants and wildlife species and are a critical link in the life cycles of migratory birds. Unfortunately, wetlands have often been viewed as unproductive wasteland and, since the arrival of the Acadian settlers, may have been filled in or drained. The coastal marshes were used for agriculture but freshwater wetlands have more often been used for development purposes.

In order to provide effective water management, several changes must be made to the way waste disposal and land use practices are managed. It is also important to install waste disposal systems that protect the quality of receiving waters; to undertake land use activities in a way that minimizes the generation of silt; and to protect and support the natural function of water systems, especially wetlands. Steps also must be taken to eliminate acid precipitation. In summary, water should be managed as a valued resource to be conserved rather than a cheap commodity to be wasted.

The following goals are proposed for sustainable use of our water:

Goal 1:

To protect aquatic ecosystems for plants and wildlife (flora and fauna).

Goal 2:

To provide safe, adequate, and reliable water supplies for individual, municipal, industrial, and agricultural use both now and in the future.

Goal 3:

To ensure that all effluents discharged to watercourses are of a quality that will eliminate adverse impacts and to clean up existing contamination problems.

Goal 4:

To coordinate water resources among all users in a manner that will achieve the greatest societal value, including the importance of conservation.

Some Recent or Current Initiatives:

The Minister's Task Force on Clean Water was established in June 1989 to "... develop a new Water Resource Management Strategy by reviewing and defining policies to manage surface water and groundwater resources for our use and that of future generations." The task force has completed its mandate. Deliberations of the task force were considered when preparing this document.

Local municipalities and the provincial government are jointly funding sewage treatment programs in central Colchester County and the Annapolis Valley which total $32 million.

The Clean Annapolis River Project Society is a non-profit citizens group that is concerned with degradation in the Annapolis River. They have targeted four areas for action: (a) Middleton Water and Energy Conservation Project, (b) creation of wetlands for waterfowl rearing, (c) streambank reforestation to demonstrate protective measures against effects of agriculture, and (d) shoreline litter pickup along the river.

Sackville schools organized and conducted a cleanup of the Little Sackville River and the planting of seedlings along the banks of the river.

The City of Dartmouth, through its volunteer Dartmouth Lakes Advisory Board, has actively protected watercourses within city limits from nonsustainable development activity. One practical result of this policy has been the protection of lakes within its ever-expanding City of Lakes Business Park. These lakes have served as a beneficial marketing tool and a healthy passive recreational area for nearby offices.

The Nova Scotia Power Corporation has reduced chemical spraying of their transmission corridors.

The Nova Scotia Department of Transportation and Communications has greatly reduced the amount of pesticides in their roadside spraying program.

Proposed Initiatives:

2.1 Designate a single provincial lead agency with a strong mandate to coordinate the management of water resources in accordance with well-defined principles, goals and objectives.

2.2 Implement provincial policies that integrate water and land use management.

2.3 Develop and enact a comprehensive Water Resource Act to replace the existing Water Act, to integrate water and land use management mechanisms, and to provide for planning on a watershed basis.

2.4 Review and amend all other existing water-related legislation so that it is consistent with principles, goals, and objectives of effective water resource management.

2.5 Develop and adopt provincial water quality standards and objectives for all water uses. Water uses should include water required for wetlands, wildlife, and waste disposal.

2.6 Ensure that municipal, provincial and other water supply and pollution control services are well planned, are cost effective, and promote conservation.

2.7 Require the development of water supply watershed management protection plans that integrate land use activities.

2.8 Develop and implement a plan to create and coordinate water resource databases that include critical ongoing monitoring of water quality and quantity.

2.9 Develop education, communication and information programs to promote stewardship of water resources by all Nova Scotians.

2.10 Develop a provincial policy on the export of water, which recognizes that it should be permitted only if the water is surplus to current and expected needs and the export is subject to environmental impact assessment.

2.11 Define and clarify the limits of provincial and federal jurisdiction respecting freshwater and saltwater boundaries. (Also mentioned in the Fisheries and Aquaculture component)

2.12 The provincial government should investigate further reduction and/or alternatives to the use of pesticides on roadsides and alternatives to the salting of highways.

2.13 The provincial government should implement the recommendations of the Water Task Force Report.

2.14 Encourage watershed advisory authorities for all major watersheds with membership from all user sectors including local users.

2.15 The Department of Health should undertake by 1995 to ensure that all existing private on-site sewage disposal systems are functioning properly. In addition, the government should implement a province-wide public awareness campaign on the proper use and maintenance of septic systems, consider a program for the routine pumping of septic tanks by licensed contractors, and rescind Section 39 of the Health Act so that no new sub-standard private on-site sewage disposal systems are approved.

The Soil

Soil is one of the key natural resources. It is fundamental to forestry and agriculture; therefore it has been addressed under those two sectors.

Biological Diversity

"There is still time to save species and their ecosystems. It is an indispensable prerequisite for sustainable development. Our failure to do so will not be forgiven by future generations."
World Commission on Environment and Development, ***Our Common Future***

Biological diversity refers to the variety of species within the biosphere. Its components include the genetic variation within individual species, the different species within a habitat or region, and the variety of habitats and ecosystems.

It is increasingly recognized that the ecosystems of this planet are all interconnected. For example, recent decreases in our insect-eating songbirds are being attributed to changes in the Amazon. We do not fully understand these interrelations, but we are becoming aware that all species, including humans, are interdependent.

Species extinctions caused by human activities are occurring at unprecedented rates because of disappearing and changing habitats. At the same time wild material is worth billions of dollars to the world economy in medicines, improved crop strains, and raw materials. There are also moral, aesthetic, cultural, educational, recreational, and purely scientific values associated with wild material. These values are difficult to assess in economic terms.

Significantly reducing the size of ecosystems almost inevitably results in the loss of some species and reduces the genetic variation in others. This in turn can lead to instability and change in the system being protected. Considerations such as size and shape of protected areas, connections with others, and adjacent land use can all help mitigate this difficulty.

The World Commission on Environment and Development described the preservation of species and ecosystems as an "indispensable prerequisite for sustainable development." Their report lead to a national "endangered spaces" campaign, now endorsed by Canada and four provinces/territories, to complete the adequate representation of Canada's natural regions with at least 12 percent of the land base by the year 2000.

Preservation of Nova Scotia's biological diversity means adequate representation of all its species, habitats, and ecoregions. The diversity of flora and fauna in the future will indicate whether protection was adequate.

In the almost 400 years since European settlement most of Nova Scotia has been heavily modified. The impact has not been consistent. Small pockets of land remain that have experienced little or no disturbance. Other areas have the potential to revert or be readily restored. Areas that have been most heavily impacted are those most suited for farming or are easily accessible, highly productive forest lands and urban areas. The amount of land committed for purposes other than conservation continues to increase such that opportunities to preserve our natural heritage are diminishing.

Nova Scotia has some 300 species of birds, mammals, amphibians, and reptiles and 3000 species of plants. Some 34 distinct habitats are also recognized. Natural areas also provide a variety of outdoor recreational opportunities, including an estimated 1.3 million day use visits and camper nights annually in provincial parks.

Already, due to intensive use, what we can preserve in some regions (e.g., the Annapolis Valley) is only a pale reflection of what must have been there originally. Others (e.g., the Highland Plateau) are already well represented.

Protection means the exclusion of activities that substantially alter what is being protected. Generally this means farming, forestry, mining, flooding, even extensive road development and power lines. It may also require additional management of recreational activities such as hunting or hiking.

Land designated for conservation is not necessarily off limits. Compatible uses include recreation, tourism, education, and research. Less obvious uses include environmental buffering (e.g., using forests to clean air) and water supply.

Protection has been achieved through legislation, such as the National Parks Act, the Provincial Parks Act, and the Special Places Act (nature reserves) among others. Other acts, such as the Wildlife Act, allow for the protection of habitats, but are generally used for the management of wildlife species. Protection also can be achieved by private land owners, including individuals, non-government organizations, and corporations.

Wild animals range throughout Nova Scotia. Protection is afforded for some species through regulation and policies. These policies are intended to ensure there is sufficient habitat outside of protected areas and to control "resource extraction" (hunting and fishing) of these species.

Setting up special management areas around protected areas is another means to improve protection. These buffer zones allow resource extraction, but are planned in consideration of the adjacent area. For a forest reserve they could include planting native species, planning cutting to ensure that the reserve does not become isolated among clearcuts, or using selection cutting. Buffer zone management is not yet a widely used practice in Nova Scotia. Consider the following statistics:

- The federal government is the largest player in the preservation of our natural heritage with three National Parks (including parts of Louisbourg) totalling 2.5 percent of the province.
- Four sites that are designated under the Special Places Act protect 0.004 percent of the province; more than 80 candidate sites have been identified.
- Nova Scotia has 117 provincial parks, many of which function well as tourism and recreation resources, but only a few contribute significantly to conservation. The 1988 Parks Act amendments that allow designation of parks or zones of parks for purposes such as natural environment have not yet been implemented. Provincial parks represent about 0.2 percent of the province.
- The province's game sanctuaries and wildlife management areas restrict hunting, but most are managed as forestry operations.

The following goals are proposed for the preservation of biological diversity:

Goal 1:
To ensure the protection of biological diversity.

Goal 2:
To ensure the representation of habitats and regions.

Goal 3:
To enable individuals to readily conserve biological diversity on their property.

Goal 4:
To provide sustainable recreation and tourism opportunities recognizing the interests of non-hunters and hunters alike.

Goal 5:
To recognize the intrinsic value of unique and representative natural areas.

Some Recent or Current Initiatives:
Nova Scotia has undertaken to identify a system of representative areas including both private and Crown lands, based on the natural regions of the province. The Department of Natural Resources is committed to completing this system plan by 1993.

The provincial government has set aside four small sites for protection under the Special Places Protection Act. Eighty other sites are being considered for designation, and more are being identified.

As part of a government commitment to develop a system plan for protected areas by 1993, the 1984 draft *Natural History of Nova Scotia*, which defines nine regions and 64 subregions, is being revised. The Nova Scotia Museum is the coordinating body for this initiative.

The Endangered Spaces campaign, initiated by World Wildlife Fund Canada and supported by over a dozen Nova Scotian nongovernment organizations, is a concerted effort by government, industry and public interest groups and individuals to set aside complete and adequate representation.

Companies such as Bowater Mersey, non government organizations such as the Nature Conservancy of Canada, and individuals are formally conserving significant sites.

A review of provincial wildlife policy by the Wildlife Advisory Council is under way. This review will consider all major land and water based issues related to wildlife.

Proposed Initiatives:

3.1 Enact legislation to protect endangered species. Ensure the assessment and management of provincially endangered species and associated habitat and cooperate with the appropriate agencies on nationally endangered species.

3.2 Develop a flexible and integrated system that permits and encourages the conservation of species and habitats on private lands through such mechanisms as voluntary designation, conservation easements, and the trade of lands with government.

3.3 Complete a network of protected areas adequately representing each of the province's theme regions by the year 2000. The areas so protected will include private stewardship. For initial discussion purposes we suggest a goal of 12 percent of land and water for protection. All existing old growth forests will be included in this 12 percent.

3.4 Develop a system that encourages that land set aside for other conservation purposes, such as wildlife corridors, wildlife management areas, or public water supply, contribute as much to the preservation of biological diversity and the system of protected areas as their situation allows.

3.5 Place the responsibility for parks and wildlife (currently administered by the Department of Natural Resources) and special places (currently administered by the Department of Education) under one agency. This agency must give these programs a much higher profile than currently exists. The Heritage component of the Special Places Act should remain under the jurisdiction of the Department of Education.

3.6 Direct additional resources to the Special Places Program and the Systems Planning Program for Parks and Protected Areas. Direct sufficient resources to ensure the timely implementation of the resulting plan.

3.7 Expand the existing program of incentives for those who comply with the Forest/ Wildlife Guidelines and Standards of the Nova Scotia Department of Natural Resources so that the incentives apply to land owners whose property is not managed under a joint federal/ provincial agreement. Give serious consideration to converting the Forest/Wildlife Guidelines and Standards to regulations. (Also mentioned in the Forestry component.)

3.8 Develop and promote planning strategies which maximize the effectiveness of protected areas and the protection of habitats outside protected areas.

3.9 Develop education, recreation, and tourism opportunities that are possible because of protection of natural areas.

3.10 Develop a strategy to reduce the impact of off-road vehicles on wildlife and their habitats and the forest environment. (Also mentioned in the Forestry component)

3.11 Establish a Nova Scotia Nature Trust to acquire and possibly manage protected areas, especially those on private land.

Economic Sectors

Wastes

As the handling, treatment, and disposal of wastes affects the viability of all economic sectors, wastes are discussed prior to those sectors. More and more, wastes are being viewed as an economic resource and as an expense.

Note: Hazardous wastes and municipal solid wastes are covered by this component. Air emissions are covered under the Air component. Sewage that discharges to the marine environment is covered by the Fisheries and Aquaculture component; whereas sewage that discharges to fresh water is covered under the Water component.

Canadians are the largest producers, per capita, of solid wastes in the world, and Nova Scotians are producing their share. The average Canadian produces 620 kilograms of garbage a year, which adds up to 30 million tonnes of solid waste generated in this country in one year. In the Halifax-Dartmouth Metropolitan area alone, 270 000 tonnes of garbage were sent to the landfill site in the past year. And this problem of garbage disposal is not confined to the metro area, as many towns, villages and rural areas in our province are struggling with the

problem of solid waste disposal. We all produce vast quantities of waste materials, but none of us wants disposal facilities in our vicinity.

Commercial and industrial ventures are major generators of solid wastes. Improper disposal of these wastes can be both unsightly and detrimental to the environment.

All this has a very negative impact on our society and our economy. It costs a great deal of money to dispose of waste, and the cost is rising rapidly. It also requires a significant amount of land to bury garbage. If proper environmental controls and performance monitoring are not conducted expensive cleanup may be required. We Nova Scotians are recognizing that there is a problem with garbage disposal—a problem that has been quietly growing for many years, but which has now reached significant proportions.

Garbage generation tends to be directly proportional to economic growth. Therefore, since we are encouraging economic development, we must be ever vigilant to minimize garbage generation. As there are many "wastes" that can be reused or recycled for economic gain, all institutions should thoroughly examine this opportunity.

The problem is not just the volume of garbage. Much of the waste produced by both industry and business as well as by households contains toxic material, which can have an impact on the long term health of the environment.

"A lot of what we see today as waste will become tomorrow's raw material."

On the positive side, Nova Scotia seems to be waking up to the problems created by over-consumption and wasteful lifestyles. The result has been an upsurge in awareness and the development of programs to implement the concept of the four Rs to combat our garbage problem: Reduce, Reuse, Recycle, and Recover. Municipalities have implemented recycling efforts, and volunteer groups have made heroic efforts to make people aware of the problem and educate them in ways to help combat it. Government has promoted an examination of alternative disposal techniques spurred by public concern and rising costs of traditional approaches to waste disposal.

In order for current and future recycling efforts to be effective, even in the short term, stable markets must be developed for recycled resources. Clearly, government must take the lead in this area.

There is no form of waste management other than reduction that is pollution free. Our challenge is to determine the best combination of practices for each situation.

The following goals for sustainable disposal of our wastes are proposed:

Goal 1:

To reduce the amount of wastes generated by all individuals and institutions.

Goal 2:

To promote the reuse, recycling, and recovery of resources.

Goal 3:

To protect public health and the environment from the dispersal of pollutants.

Some Recent or Current Initiatives:

Many Nova Scotians have become involved in recycling. Numerous volunteer organizations have monthly recycling drives. Items such as newsprint, glass, tin, aluminum, and plastic are collected.

A number of municipalities have organized regular curbside and depot collection of some recyclables.

National Sea Products is utilizing fish waste products to produce organic lawn and garden products.

The National Packaging Protocol, which calls for a 50 per cent reduction in packaging by the year 2000 based on 1988 levels, has been agreed to by industry, all provinces, and the federal government.

The Province of Nova Scotia has adopted legislation and regulations to control the disposal of (a) hazardous wastes, (b) derelict vehicles, and (c) litter. The province has also enacted legislation to encourage the construction of proper solid-waste handling facilities.

The Resource Recovery Fund has been established to provide financial assistance to municipalities for putting in place infrastructure for recycling programs. Monies for this fund are provided by industry.

The Grace Maternity Hospital has implemented a program to reduce the use of disposal diapers.

Voluntary Planning, an independent, volunteer organization with representation from various sectors and interests, has implemented a system of awards for students/schools that participate in waste management programs.

Proposed Initiatives:

4.1 Implement recommendations made under the National Packaging Protocol to reduce packaging by 50 per cent by the year 2000. If targets under the protocol are not met, consideration will be given to enacting legislation to standardize containers.

4.2 Conduct public awareness campaigns to inform all waste generators about (a) waste disposal costs, (b) pollutants caused by solid wastes, and (c) monies that can be earned by recovering resources. One of the objectives of an awareness campaign is to inform the public as to what is hazardous, what contains hazardous materials, what are the mechanisms for safe disposal, and what alternatives are available.

4.3 Establish a framework for the implementation of integrated waste management in Nova Scotia. This should include establishing objectives and standards for waste management facilities. Regionalization of these facilities should be encouraged to take advantage of economies of scale. This framework should emphasize the need for improved education and consider the use of the following instruments: (a) distribution fees, (b) deposits on containers, (c) user fees for waste disposal, and (d) regulation of non-refillable containers. It should also place an emphasis on the detoxification of the waste stream.

4.4 Coordinate a strategy for the Maritime Provinces to encourage the location of central hazardous wastes disposal facilities. This strategy must be developed by December 1993 and implemented by December 1996. Ensure that trans-boundary movement of hazardous wastes does not lead to the disposal of hazardous materials from outside the region.

"The location of a hazardous waste disposal facility is overdue."

4.5 Ban the distribution of advertising flyers to households by 1993 unless they are printed on paper that can be readily recycled in Nova Scotia. Encourage municipalities to develop by-laws concerning private distribution of advertising material. These by-laws should address who delivers the material, how it is packaged, and the right of refusal.

4.6 Establish a program to facilitate the exchange and utilization of surplus industrial waste products.

4.7 Redesign production systems to minimize hazardous wastes production and ensure that all industrial processes (involving persistent materials) provide for appropriate waste management from "cradle to grave" (i.e., managing wastes from production to ultimate destruction).

Agriculture

Agriculture is a significant contributor to the economy of Nova Scotia, with a farm gate value of approximately $315 million in 1990. This represents 1.4 percent of provincial gross domestic product (GDP), and 25 percent of Nova Scotia production is exported. Some 4000 farmers manage a significant portion of the land base of the province, and utilize water resources found on and under it.

The agriculture industry is a large user of water. Unlike many other water resource managers, farmers also live and raise families in the immediate environment of their farms, and so they are uniquely affected by the consequences of water management decisions.

The greatest asset of the farm is its land base. Deterioration of the land has a direct effect on the long-term viability of the farm. Nova Scotia has a tradition of family operated farms, very often using the same farm for generations. Farmers obviously have an interest in the "sustainability" of their farms.

Consumer expectations of farm products dictate what can be done on the farm. Product price and appearance are the most important factors in the consumer market. Nova Scotia farmers are expected to produce perfect, blemish-free product, at a price determined by the lowest possible price for similar product from anywhere else in Canada, or the world.

Agricultural practices today are considerably different from those of even 20 years ago. New technology on the farm has provided consumers with a larger variety of blemish-free products at low prices. Efforts to enhance productivity and maximize crop yields have resulted in an increased use of fertilizers and pesticides (all natural and synthetic pest control products). This has increased the potential for pollution of surface and groundwater. In addition, the intensive use of soils to attain maximum yields can result in soil degradation from erosion,

acidification, and compaction. A move toward increased "sustainability" will require continued change by both the agriculture industry and the consumer.

Nova Scotians expect to eat all types of foods year-round. As a result, produce must be imported from as far away as the southern hemisphere, which causes an increase in energy consumption.

The following goals for a sustainable farm industry are proposed:

Goal 1:

To encourage farming methods that maintain soil integrity and provide a sustainable source of income for farmers.

Goal 2:

To achieve maximum sustainable yields of healthy, high-quality farm products.

Goal 3:

To minimize the negative impacts of farm-related activities on water quality.

Goal 4:

To encourage the consumption of locally grown products and the diversification of the agriculture industry in harmony with sustainable development.

Some Recent or Current Initiatives:

The Nova Scotia Department of Agriculture and Marketing administers an Integrated Pest Management Program. This program is designed to minimize the amount of pesticides required to control pests.

Canada and Nova Scotia have signed a $ 1 million agreement to assist farmers to adopt soil and water conservation methods.

The Nova Scotia Department of Agriculture and Marketing administers a land evaluation program for farmers. Farm resources are inventoried and recommendations made as to the most appropriate land use.

The Nova Scotia Department of Agriculture and Marketing provides financial assistance to farmers for manure storage facilities when it is shown the facilities have adequate storage for a seven-month period and the farmer has adequate acreage upon which to utilize the resource.

There is a growing awareness among the agricultural community of the need for sophisticated crop management practices that minimize farm inputs. A group of farmers, certified members of the Organic Crop Improvement Association, have eliminated the use of chemical fertilizers and pesticides on their farms.

The Nova Scotia Federation of Agriculture cooperates closely with the Nova Scotia Department of Agriculture and Marketing on a number of sustainable development issues, including pesticide safety certification training, on-farm sprayer calibration, and unwanted pesticide disposal. Growers and department staff work closely on initiatives to improve and protect the environment.

Proposed Initiatives:

5.1 Develop provincial land use policies and encourage all municipalities to develop planning strategies that provide for the protection of land that has potential for agricultural production.

5.2 Implement an awareness campaign to promote the economic and environmental advantages of Nova Scotia produce and the importance of self-reliance in the food and agriculture industry.

5.3 Develop a program to facilitate the exchange and utilization of surplus agricultural chemical products.

5.4 Cooperate in establishing a national certification program for organically grown produce.

5.5 Develop government policies and implement government programs that encourage research and investigation into and adoption of sustainable farm management practices and technology. These policies and programs must include on-farm and off-farm research and an examination of existing programs and subsidies to determine if they lead the agrifood industry toward sustainable development. Ensure the results of research are communicated to farmers and those experts, both inside and outside the Department of Agriculture and Marketing, who are advising farmers.

5.6 Conduct a thorough analysis of modern pesticide use and recommend criteria for the appropriate use of synthetic pesticides, practical alternatives to their use, and targets for their reduction. The criteria should consider the rights of adjacent residents.

5.7 Develop a strategy to reduce the impact of off-road vehicles on agricultural land.

5.8 Conduct an environmental and economic assessment of deer farming in Nova Scotia and continue to follow the strict guidelines and regulations for the issuance of deer-farming licenses.

5.9 Ensure the Department of Agriculture and Marketing is able to provide advice regarding non-chemical farming methods.

Forestry

Forests play a major role in the economy of Nova Scotia. They also cover approximately 77 per cent of the province. The industry provides up to 13,700 full-time or seasonal jobs and a similar number of indirect jobs and contributes $860 million to the economy, representing 3.1 percent of provincial GDP and 24 per cent of total provincial exports to international destinations.

Seventy-five per cent of Nova Scotia forest lands is privately owned, and the harvest from privately owned land represents over 80 per cent of the total harvest. The property rights of private land owners and their tradition of independence is a factor to be considered. However, this attitude must be balanced by the "rights of the common."

While the forestry sector in Nova Scotia is dominated by pulp and paper manufacturing, many other products are produced, including sawlogs and lumber, Christmas trees, maple syrup, firewood, poles, and pilings, all of which are important to the local economy.

A number of forest management techniques are currently being used. These include the promotion of natural regeneration, clearcutting, patch cutting, tree planting, and chemical weeding to promote the growth of planted tree seedlings.

There is continuing debate about the impact of harvesting and reforestation methods on the forests and wildlife. Large areas of reforestation may reduce species and age diversity where the previous stand was of uneven age and of greater diversity. Depending on the species, this can also decrease the forest's disease resistance. Where softwoods are promoted artificially, there may be an increase in the acidity of the runoff.

Prior to mechanization, forestry was a more labour-intensive industry than it is today. In many cases access to woodlots was gained by poor-quality forest access roads. This restricted extraction to the winter and summer seasons when

acceptable road conditions could be depended on. However, this was also the period when poorer quality seasonal roads caused extensive stream siltation and/or river drives resulted in stream alterations and damage to fish habitat.

Our ability to harvest the forest has increased dramatically with the advent of more mechanized forestry practices. And with the increased mechanization has come an increased potential to cause serious harm to our land and water resources.

The construction of forestry roads can also make the forests more accessible for hunting, recreational use, and development. This improved access can be a mixed blessing, as uncontrolled and careless use of the forest ecosystem for recreational purposes (especially the use of all-terrain vehicles) can cause serious damage to the forest environment and to sensitive habitats, in particular.

"People criticize forestry practices but live in wood frame houses, people are concerned about agricultural produce, but eat the produce."

The forests of Nova Scotia are capable of yielding significantly more than current yields from existing mature stands. One reason the yield from natural stands is so low is that our forests have been exploited and high-graded for over 200 years. Only in the last couple of decades have we begun the task of restoring our forests to a more productive and healthy state. At current levels of management, the Department of Natural Resources indicates the industrial harvest based mainly on the softwood species could be increased by more than 50 percent by the year 2025.

Today's forest industry poses many challenges if we are to meet the goal of sustainable development. We must maintain our forests so they continue to supply pulpwood and sawlogs for the forest industry of the future and ensure that our forests continue to be an important contributor to a healthy environment.

The following goals for sustainable development of Nova Scotia's forests are proposed:

Goal 1:

To protect the long-term diversity, stability, and health of Nova Scotia's forest ecosystems.

Goal 2:

To enhance the viability of our forest-based manufacturing industries and other industries that depend on healthy forest ecosystems, by diversifying our industry and increasing value-added products based on a sustainable and diverse forest ecosystem.

Goal 3:

To rehabilitate and diversify our forests so they are capable of yielding increased and sustainable volumes of higher quality products.

Goal 4:

To enhance fish and wildlife habitats, water quality, recreational opportunities, and associated values.

Some Recent or Current Initiatives:

The Nova Scotia Department of Natural Resources and Forestry Canada have cooperated in a progressive forestry management program under a federal/provincial agreement that provides incentive assistance for approved forest management operations. This is coupled with professional and technical advice and assistance.

The Nova Scotia Department of Natural Resources has developed and implemented Forest/Wildlife Guidelines and Standards to enhance wildlife habitat. These are mandatory on Crown lands and lands receiving assistance under the federal/provincial agreement and are encouraged on other lands.

In September 1991 Bowater Mersey Paper Company completed a three-year inventory of wildlife by forest type. This information will enable the company to predict the impacts of forestry practices on wildlife.

The Canadian Institute of Forestry, Stora Forest Industries, Scott Worldwide Inc., Forestry Canada, Nova Scotia Department of Natural Resources, Wildlife Habitat Canada, St. Mary's River Association, and Fisheries and Oceans Canada are cooperating on a project to assess the impacts of various forest management operations and to develop techniques that can be used to enhance wildlife habitat.

Proposed Initiatives:

6.1 Provide for an independent review of forest policy in Nova Scotia with a view to making recommendations to improve forest management in the future. This will be designed to reach a consensus on what benefits the forests should provide to the people of Nova Scotia and to meet the requirements of sustainable development and the integrated management of the resource.

6.2 Review timber harvesting practices such as clearcutting, cut block size and configuration, manual weeding, harvesting of small trees, high-grading, a landscape management approach, hardwood to softwood conversion, and the use of pesticides, taking into account the characteristics of tree species, aesthetics, site conditions, and anticipated impacts on wildlife habitats and forest ecosystems. The review should make recommendations for management practices that can meet the objectives of sustainable development.

6.3 Prepare and circulate, for public review and comment, a long-term forest management plan for the province, setting out how sustainable development of forest resources is to be achieved.

6.4 Expand the existing program of incentives for those who comply with the Forest/Wildlife Guidelines and Standards of the Nova Scotia Department of Natural Resources so that the incentives apply to land owners whose property is not managed under a joint federal/ provincial agreement. Give serious consideration to converting the Forest/Wildlife Guidelines and Standards to regulations. (Also mentioned in the Biological Diversity component)

6.5 Expand education and extension efforts relative to the Forest/ Wildlife Guidelines and Standards and forest management practices generally, targeting those who do not participate in the private land incentive program.

6.6 By 1995 develop a natural resource accounting system that reflects the full economic and environmental costs of forest use.

6.7 Secure a longer term commitment to funding for forest management incentive programs to ensure the forest resource is sustainable in the longer term.

6.8 Develop a strategy to reduce the impact of off-road vehicles on wildlife and their habitats and the forest environment. (Also mentioned in the Biological Diversity component)

6.9 Develop provincial land use policies that protect forested land from loss to other land uses.

6.10 Encourage that pulp and paper plants switch to chlorine-free bleaching of pulp.

Fisheries and Aquaculture

The importance of the fishery to the Nova Scotian economy cannot be overstated. It contributes to 3.6 per cent of the provincial GDP and accounts for over one-third of our exports, outstripping all other industrial sectors. It provides employment to nearly 16,000 fishermen and over 9,000 fishplant workers in over 350 licensed processing facilities. It also supports some 3,000 jobs in vessel construction, repair, and related sectors and provides opportunities to suppliers of everything from netting twine to groceries.

Most Nova Scotians live within 20 kilometres of the coast. The coastal zone dominates the physical character of the landscape. It has also been a dominant factor in shaping the economic and cultural character of the province.

Aquaculture is a growing industry in Nova Scotia. The province's extensive coastline offers many advantages for development, and commercial facilities are currently producing a variety of species with an annual value of $5.4 million. Aquaculture offers one of the few opportunities for expanding the fisheries, since most currently marketable stocks "in the world" are now being fully or over-exploited.

Responsibility for managing our marine fisheries rests exclusively with the federal government. Jurisdiction over aquaculture and other coastal zone activities is shared between Nova Scotia and Canada. This overlap and, in some cases, uncertainty present a real challenge in terms of developing a sustainable development strategy for our fisheries and aquaculture sectors.

In recent years fisheries management has focused on a species-by-species application of catch limits or quotas. This, in turn, has led to a large federal bureaucracy devoted to the establishment and management of an elaborate system of quotas and supporting regulations. It has also led to a significant wastage of disallowed species. As it turns out, this system has been marginally successful despite its basis in the concept of sustainable yield from a fishery.

The focus on single species quota management has been at the expense of gaining a better understanding of the marine ecosystem as a whole and providing adequate protection for fish habitat and ensuring the sustainability of the fishery.

In aquaculture there are increasing conflicts between aquaculturists and other users of the coastal zone. Aquaculture operations can have physical and chemical effects on marine habitats, which might affect the interests of fishermen. Other resource users such as cottagers and boaters resent being denied exclusive access to large coastal areas.

Aquaculture development potential is directly related to the availability of suitable sites, including an assurance of high-quality water. This brings in a direct link with land-based, upstream activities that may affect coastal water quality.

The following goals for sustainable development of Nova Scotia's marine fisheries and aquaculture sectors are proposed:

Goal 1:
To improve the overall health of our marine ecosystem.

Goal 2:
To ensure the sustainability of our fisheries resource and marine habitats.

Goal 3:
To eliminate bacteriological and chemical contamination, which leads to shellfish closures or makes areas unsuitable for aquaculture.

Goal 4:
To control litter and discharge of persistent contaminants in our coastal zone and adjacent areas.

Some Recent or Current Initiatives:
The Maritime Fishermen's Union and the Clean Nova Scotia Foundation have developed marine anti-litter campaigns.

The Bras d'Or Institute has prepared a guide for the development of an integrated resource management plan for the Bras d'Or Lakes watershed.

The governments of Canada and Nova Scotia have signed a $200 million joint agreement to install the infrastructure required to treat sewage generated in the Halifax–Dartmouth Metropolitan Area.

The governments of Canada and Nova Scotia have signed a $34.3 million joint agreement to clean up Muggah Creek (Sydney Tar Ponds) and have implemented a program to achieve this objective.

Six Cape Breton communities and the provincial government are jointly funding the $78-million Industrial Cape Breton Sewage Treatment Program.

The Gulf of Maine Council on the Marine Environment, which includes representation from each province and state bordering the Gulf (including Nova Scotia), is committed to maintaining and enhancing the marine environment in the Gulf of Maine. The Council has developed a Gulf Action Plan and a gulf-wide monitoring program.

Proposed Initiatives:

7.1 Encourage the federal government to complete a strategy for sustainable fisheries that places less emphasis on single species quota management and more emphasis on the sustainability of the marine ecosystem as a whole.

7.2 Develop a comprehensive coastal zone management plan for Nova Scotia. This plan should include the designation of a single government contact for the government review of projects in the coastal zone. During the development of the plan, a review of existing acts and regulations should be conducted to ensure they provide opportunities for the setting of use and quality objectives, inter-agency planning, application of preventive strategies, and public consultation.

7.3 Define and clarify the limits of provincial and federal jurisdiction respecting freshwater and saltwater boundaries. (Also mentioned in Water component)

7.4 Assist municipal units in considering uses and objectives for coastal waters when undertaking land-use planning for adjacent lands.

7.5 Require that all sewage discharged to the marine environment be treated to a level adequate to prevent the closure of shellfish areas due to bacteriological contamination.

7.6 Encourage and assist the expansion of current anti-litter campaigns and programs to eliminate discharge of contaminants from vessels, including ballast water.

7.7 Develop and implement a province-wide education/information program on the value of and resource conflicts in the coastal zone.

7.8 Encourage the federal government to endorse the "Marpol Convention" and the "Law of the Sea Convention."

Tourism and Recreation

Tourism is the world's fastest growing industry, predicted to be the world's largest by the year 2000. It generates $810 million in revenues for the province, making it the third-largest industrial sector. An estimated $61 million in tax revenues were generated for the province in 1990, as well as an estimated $27 million in tax revenues for municipalities. Approximately 33,700 Nova Scotians are employed in full-time and part-time jobs, including seasonal and indirect employment.

Tourism in the 1990s is different than in the past. Consumers are more demanding, seeking higher quality, value-for-money, and unique experiences. International competition for the tourist is intensifying, while global transportation networks make even the remote locations accessible to visitors.

If Nova Scotia is expected to be a player in the tourism market, we must ensure that the product we are offering is competitive with other destinations. The benefits accruing from increased tourism can be substantial, as tourism dollars spent in Nova Scotia represent new dollars to the economy.

"... we now need the political will to ensure a strong land acquisition program."

One of the fastest growing segments is ecotourism—tourism based on the natural environment. Ecotourism includes such activities as nature observation (e.g., whale and bird watching), and outdoor recreation (hiking, boating, camping, diving). Traditional activities such as touring are also dependent upon the natural environment as well.

Tourism is a resource-based industry that is extremely dependent upon the natural environment. Traditionally, tourism was considered to have little or no adverse impact on the environment. Of late, however, it has been recognized that if appropriate measures are not taken tourism can have a deteriorating effect on the natural resources on which it is dependent.

A number of agencies, groups and individuals are involved in environmental tourism, with no one agency totally responsible for overall planning and policy. Key players include the Canadian Parks Service, the Nova Scotia Department of Tourism and Culture, the Nova Scotia Department of Natural Resources, the Nova Scotia Sport and Recreation Commission, the Nova Scotia Museum, and several industry and community-based groups.

The following goals are proposed for a sustainable tourism and recreation sector:

Goal 1:

To encourage tourism development that is sympathetic to and supportive of the natural environment and its conservation.

Goal 2:

To encourage recreational development that is sustainable and maximizes opportunities for and the participation of Nova Scotians and tourists alike.

Some Recent or Current Initiatives:

The Nova Scotia Department of Tourism and Culture promotes outdoor tourism as a major product, as well as promoting the province as a scenic touring destination. Over 100,000 copies of the publication *Nova Scotia Outdoors* are distributed annually to tourists. A fishing map is also produced; and a new outdoor tourism map will be produced for 1992.

A number of communities and individuals recognize environmental tourism as a growth opportunity. Examples include the development of the Joggins Fossil Centre, the Parrsboro Museum of Geology and Paleontology, the Queens County Rails-to-Trails group, numerous whale- and bird-watching tours, packagers of bicycle, diving, and wilderness excursions, and tidal bore rafting on the Shubenacadie River.

Canada and Nova Scotia have recently signed a Cooperation Agreement on Sustainable Development, which can provide assistance for tourism projects of an environmental nature.

The Nova Scotia Department of Tourism and Culture and the campground industry of the province are involved in ongoing efforts to improve the Nova Scotia campground sector. Cooperation is also ongoing between the department and the fishing and hunting outfitters of the province.

Proposed Initiatives:

8.1 Review the provincial tourism strategy to ensure "ecotourism" becomes the primary focus. This review should include the development and adoption of sustainable tourism codes of conduct for industry and government.

8.2 Assist in the development of outdoor tourist attractions, activities and services that promote access to nature and provide a degree of environmental education (i.e., whale-watching, bird-watching, fossil and rock hounding, wilderness excursions, and hiking trails). Develop ways to broaden the eco-experience, making it educational, historic, and participatory.

8.3 Develop and market outdoor products that are market-driven (i.e., ecotourism, scenic touring, outdoor recreation).

8.4 Foster more cooperation among all levels of government, between departments, and with industry, communities, organizations, and the public on matters of mutual concern and interest in areas affecting tourism and the environment.

8.5 Enhance the environmental tourism infrastructure (i.e., parks, Special Places, beaches) by providing more interpretation, recreational amenities, and visitor services where appropriate.

8.6 Ask the federal government to locate some of the proposed new national marine parks and historic sites in Nova Scotia.

8.7 Examine the applicability of landscape management to protect areas of scenic value. This may include greenbelt requirements, the establishment of more scenic viewpoints, the strict regulation of billboards, or the establishment of natural conservation districts for development control purposes.

8.8 Establish a council consisting of federal, provincial, industry, and public representatives to coordinate environmental tourism plans, policies and programs in Nova Scotia , which would provide input to a designated provincial agency responsible for the provincial interest in environmental tourism.

8.9 Ensure that top priority is given to the recreational use of abandoned rail lines when plans are developed for the use of these corridors.

8.10 Provide training and recreational opportunities for off-road vehicles and minimize their impact outside these specified sites/usages.

Mining and Minerals

Mining in Nova Scotia began over 300 years ago, and it is still an important contributor to the provincial economy. Mineral-based activities provide income, employment, and inputs to other provincial industries. Today, mining and exploration activities contribute 4.4 per cent of Nova Scotia's gross domestic product (GDP) and 7 per cent of the province's exports. The mining sector provides 6,000 direct rural-based jobs and above-average incomes throughout the province.

Activities related to mines and minerals fall under three categories: exploration, operation, and rehabilitation. Each phase, if not conducted in an acceptable fashion, has the potential to impact the surrounding environment.

The first step of the exploration phase is the negotiation of access to private and Crown lands. Next, exploration activities include, in most cases, simple examination of outcrop and sampling of soil, water and stream sediment. In some instances, trenching, line cutting and road construction take place. Some of these activities can impact local communities and the natural environment. The final stage of exploration is the rehabilitation of any disturbed lands.

Issues to be considered for the development of a mine and the sustained production of minerals include: land access and mine location, road, rail or sea access, community relations, tailings management, mine drainage, blasting, dust, truck traffic, conflicts with other resource interests, community development, amenity preservation, blasting, stream diversions, industrial waste disposal, infrastructure and energy usage, subsidence, mine site management and reclamation planning. During the operation, monitoring of air quality, groundwater and surface water is required. In addition, continued exploration and discovery of new reserves must keep pace with mining.

When mining is conducted in highly mineralized zones, tailings disposal areas must be properly managed to avoid serious long-term impacts on groundwater and surface water. After a mine is closed, site rehabilitation must be technically sound and completed in an environmentally acceptable manner that is compatible with the surrounding land use.

The mineral industry has developed practices to minimize environmental impacts, and government legislation controls the industry's activities. Mining companies are required to post a bond to ensure site rehabilitation.

An important issue in mineral resource management is access to land for the exploration side of the industry. The more land made inaccessible for mineral exploration the lower the potential for the discovery of mines.

Mineral development activity precludes certain post-site rehabilitation land uses. Therefore, a balance must be struck between those areas that are desired for a single land use and those that can accommodate multiple land use.

The following goals for sustainable development of Nova Scotia's mineral resources are proposed:

Goal 1:
To increase recovery of metal and mineral-based products from the solid waste stream.

Goal 2:
To ensure that reclamation is an integral part of the mining cycle.

Goal 3:
To provide increased efforts to reduce environmental impacts from the mining and mineral processing cycle.

Goal 4:
To encourage processes that maximize resource extraction and recovery in mining to ensure efficient utilization of the resource and any resource co-products.

Goal 5:
To protect the long-term economic health of the mining industry.

Some Current or Recent Initiatives:
The Nova Scotia Department of Natural Resources is conducting a three phase program to examine abandoned mine shafts in Nova Scotia. This program will determine and secure the safety of abandoned mine shafts for people and wildlife. Currently the project is at the end of phase II having conducted a literature search and field verification. Phase III will involve an initiation program to secure the shafts.

The Nova Scotia Department of Natural Resources administers the new Mineral Resources Act. Under the new act:

- all new mines subject to the act must post a reclamation bond before a mining lease and permit are issued.
- mines established after the act came into force must complete an approved decommission and reclamation program before abandonment.
- an operator is required to have an excavation permit for any disruption of surface lands during the exploration phase.

Proposed Initiatives:

9.1 Encourage the development of secondary and tertiary industries linked to mineral development, i.e., value-added industries.

9.2 Enhance communication and understanding of economic and environmental matters with employees of mining companies, government, and the general public.

9.3 Ensure that government works with industry to develop equitable, cost-effective, and realistic laws designed to protect the environment.

9.4 Ensure that rare, endangered, and unique natural and heritage resources, including unique geological landforms, are identified and protected from development.

9.5 Ensure that lands destined for protection are geologically assessed so that all potential land uses can be considered prior to designation.

9.6 Encourage the full integration of environment and resource data and expedite the transfer of information to the user through high technology, in particular, the use of spatial information systems and expert and artificial intelligence systems.

9.7 Provide educational programs outlining the economic significance of minerals and the issues surrounding sustainable development and mining.

9.8 Encourage research and development of the environmental impacts related to mining and milling.

9.9 Encourage research and development regarding mine site land management and reclamation.

9.10 Encourage gravel pit and quarry operators to rehabilitate lands after use.

Energy and Transportation

Although Nova Scotia is well endowed with coal, other nonrenewable energy sources are somewhat limited. There is modest potential for offshore oil and gas development. With respect to renewable resources, Nova Scotia has considerable amounts of forest biomass, good wind and solar conditions, amongst the highest tides in the world and small amounts of other resources such as geothermal energy and hydro. The problem is not the extent of renewable resources but rather the economics of extracting the energy from these resources. Wood, although abundant, is currently supplying only about 8 per cent of total energy used. Hydro potential could include the development of more small projects, but the last major hydro source was fully developed with the Wreck Cove project, which came on line in the 1970s. Nuclear power for the generation of electricity has been rejected as an option by successive Nova Scotia governments since the middle of the 1970s, for reasons of economics as well as public concern about safety and the environment. Intermittent sources, such as wind, tidal, and solar energy, have as good or better potential in Nova Scotia than in most other places in Canada, but their use is constrained by the high costs of storage or backup systems. (The exception is passive solar designs for heating, which could be more widely incorporated in new buildings at modest cost.) Geothermal energy is currently being used as a year-round source for heat pumps in Springhill, but its potential is limited to certain coal mining districts.

"The Province of Nova Scotia ... should reinstate the nuclear power option for the benefit of all Nova Scotians."

"Nuclear energy should be rejected absolutely as an option for Nova Scotia."

An abundant and affordable supply of energy is important to our economy, comfort, and mobility. In fact, high levels of energy consumption appear to be a prerequisite of the high standard of living we now enjoy.

The Arab oil embargo in the early 1970s provided Nova Scotians with an appreciation of our dependence on hydrocarbons. The dramatic short term increase in prices made us begin to consider improving our energy conservation and efficiency. This event influenced the government of Nova Scotia to convert to the use of Nova Scotian coal for most of our fossil fuel generated power, a policy that provided much needed employment in the coal mining sector.

At present, energy prices do not reflect total economic and environmental costs. Different forms of energy have been subsidized in various ways, such as through research and development grants or through the tax structure. As well, the impacts of oil spills, acid rain, carbon dioxide build-up in the atmosphere, and

urban air pollution—all consequences that are primarily the result of energy use—are not reflected in energy prices. Artificially low energy prices have led to wasteful and inefficient use of energy, including housing design, land use and transportation systems, and appliances, automobiles, and lighting.

Many Nova Scotians have developed a "love affair" with the automobile. The majority of people would prefer to drive by themselves rather than to use some form of mass transit. This attitude has contributed to a large demand for an expensive highway network which consumes much land. As the use of railroads for the transport of people and goods has continued to decrease, it has been necessary to significantly improve our highway network. An efficient rail system is important to our heavy industry.

"Full cost-accounting is very seldom applied to transportation."

Fifty-three per cent of petroleum consumed in Nova Scotia is by the transportation sector. This sector is one of the larger contributors to air pollution. In order to reduce the negative environmental impacts of this sector, actions must be taken to reduce automobile use and to improve the efficiency of transportation.

As coal is and will continue to be used by many countries of the world for energy production, the development of technology to eliminate or greatly reduce the production of greenhouse gases when burning coal is likely to take place worldwide. The province should adapt to new technology to reduce greenhouse gases and take advantage of potential economic opportunities.

"We can create substantial opportunities in energy if we look at them as opportunities."

The most important opportunities for improving environmental quality, as well as enhancing economic competitiveness, are from energy conservation and improving the efficiency of energy use. With the gradual replacement of inefficient capital stock (for example, inefficient appliances, cars, and buildings), the potential for improving energy efficiency increases over time.

The following goals are proposed for sustainable use of energy.

Goal 1:

To reduce energy demand through conservation and improved efficiency.

Goal 2:

To minimize the negative environmental effects of energy production and use through the development and use of improved technologies. In particular, Nova Scotia should meet or exceed its provincial/federal acid gas reduction commitments and should not exceed its existing level of emissions contributing to potential global atmospheric change.

Goal 3:
To decrease reliance, over time, on nonrenewable sources of energy.

Goal 4:
To ensure that all Nova Scotians can meet their basic energy and transportation needs.

Goal 5:
To stabilize energy costs at affordable levels over the long term.

Some Recent or Current Initiatives:
The Nova Scotia Power Corporation has launched a Power Smart program to reduce demand for energy.

The Department of Natural Resources has prepared a new energy strategy to set the framework for energy policy in the province over the next several years. The four goals of the strategy—efficiency, environmental quality, security, and cost-stability—have been established in recognition of the province's commitment to sustainable development. The individual policies supporting this framework will be completely compatible with, and in fact assist, efforts to achieve a sustainable economic/energy policy.

The Department of Natural Resources continues to provide an Industrial/ Commercial Energy Analysis Program to firms with energy bills in excess of $150,000 per annum. Twenty-five industrial site analyses performed since late 1989 have identified $1.4 million in annual energy savings for participating firms.

An energy and housing conference called ENERhouse '91 was held in March 1991 focusing on measures to reduce energy use in new construction, but including such issues as indoor air quality, radon gas, and other indoor air pollutants.

In cooperation with other Maritime provinces and the federal government, a Trucker Fuel Efficiency Program is provided to the trucking industry on driving techniques, vehicle selection, and maintenance for better fuel economy and reduced vehicle emissions. It is delivered by Commercial Safety College in Masstown.

In 1990 the federal and provincial governments proclaimed legislation prohibiting oil and gas exploration and development on Georges Bank until at least the year 2000. This moratorium was to allow a thorough review of the environmental and socio-economic impacts of such activity. The review is to begin by 1996.

Prior to approval of the development plan for the Cohasset/Panuke offshore oil project, a public review commission was established to examine the environmental and socioeconomic implications of the project. Following public information sessions and hearings, the commission recommended that the project's impact would be acceptable subject to certain conditions. These conditions, which included such things as a tanker exclusion zone to protect the habitat of bottlenosed whales and a compensation plan for fishermen, were adopted as conditions of overall project approval.

In 1989 a Coal Research Agreement was entered into by the Nova Scotia Department of Natural Resources, the Nova Scotia Power Corporation, and the Cape Breton Development Corporation. Through financial contributions by each party, a fund has been established to finance research projects directly related to environmental enhancement with respect to both coal mining and the production of electricity using coal. Clean coal technologies, more efficient combustion methods, and reduced emissions are the focus of most research, which is costing approximately $750,000 per annum.

The Department of Natural Resources is currently undertaking an in-depth review of coalbed methane and its use in Nova Scotia. This may have considerable environmental significance as, on a per molecule basis, the release of methane into the atmosphere has a far greater impact on global warming than does the release of carbon dioxide in coal combustion.

Proposed Initiatives:

10.1 Develop power rate structures, including those for households, that encourage conservation. (Also mentioned in the Air component)

10.2 Encourage the development of seminars and short courses to educate real estate agents on energy efficiency. Explore options for indicating the energy efficiency of listed properties.

10.3 Encourage owners of new rental properties to identify the energy costs of individual units to prospective and existing rentors.

10.4 Encourage municipal governments to develop land use by-laws for new housing developments that require passive solar input to be addressed in site planning.

10.5 Ensure that the provincial departments of Housing, Municipal Affairs, Natural Resources, and Transportation and Communications maximize opportunities for the incorporation of passive solar energy into residential developments.

10.6 Encourage and support the development and use of alternative forms of energy, which support sustainable development. Conduct a comprehensive review of all alternate energy forms.

10.7 Encourage the adoption of new technology for reducing carbon dioxide and sulphur dioxide emissions produced when burning coal. In addition, in cooperation with other provincial jurisdictions, develop methods for reducing greenhouse gas and other undesirable emissions through a system of offsetting credits, tradeable emission permits, or other similar means. (Also mentioned in the Air component)

10.8 Encourage the capture of energy from wastes. This should include waste from municipalities, farms, industries, and households.

10.9 Change budget procedures for municipal governments and for provincially funded agencies, such as hospitals, schools, and universities, so that capital investment resulting in reduced costs from energy conservation (1) is easy to institute and (2) generates savings that are passed directly on to the implementing institution.

10.10 Set the price of energy so that it reflects all environmental and economic costs. Short-term incentives, such as taxes to promote the use of solar energy and carbon taxes, may be required.

10.11 Review new motor vehicle registration and tax schedules so that they encourage fuel efficiency. (Also mentioned in the Air component)

10.12 Review transportation policies at the provincial and local levels including the following possible measures (Also mentioned in the Human Settlements component):

10.13 Develop regional transportation plans;

10.14 Increase the use of public transit;

10.15 Establish express lanes for buses and passenger cars carrying more than two people;

10.16 Provide for the use of existing road systems for bicycle paths;

10.17 Expand programs to support van pools and other ride-sharing mechanisms;

10.18 Encourage municipalities with public transit to require that individuals purchase transit passes and display them inside their automobiles in order to park in the downtown core;

10.19 Increase provincial funding for public transport, and reward municipalities for increased transit ridership.

10.20 Encourage cooperation among different forms of public carriers to encourage easy interchange among different transportation modes.

10.21 Ensure the level of subsidization for rail transport is equal to that for road transport.

10.22 Establish a network of perimeter car parks around large urban areas with appropriate public transit connections.

10.23 Modify existing standards for new highway construction to encourage the beautification of highway interchanges.

10.24 Amend the legislative mandate of the Nova Scotia Power Corporation to include the efficient use of energy.

10.25 Encourage the provincial government to endorse the National Action Strategy on Global Warming prepared by the Canadian Council of Ministers of the Environment.

10.26 Investigate a system of standards for minimum appliance efficiency.

10.27 Ensure that before any new power generation stations are constructed, a detailed examination of all alternatives is completed, with an emphasis on reduction of energy demand.

10.28 Sponsor a design competition for add-on passive solar units for existing residential dwellings.

10.29 Develop energy performance standards for housing and incorporate them into the provincial building code.

Human Settlements

Residential development in the province, in most cases, has centred around industry and central business districts. But as transportation networks have improved, there has been a trend for development to take place in areas of preference. This has also had a huge impact on the form towns have taken, often resulting in urban sprawl, neighbourhood deterioration, and abandonment. Until the mid 1950s, land use planning in Nova Scotia was nonexistent, and by then human settlement patterns were already established. Since its inception, land use planning has generally been reactive to problems created by new development activity and, in most cases, has been used as a tool to increase the municipal tax base. With uncontrolled development we have also seen valuable land for agricultural, forestry, and other renewable resource-based industry being developed for other, less sustainable uses. Development tends to occur in agricultural areas because of low land development costs.

Safety has emerged as a top issue in local communities because of the increase in pedestrian, bicycle, and vehicular traffic. Problems may include insufficient lighting, inadequate pedestrian walkways, and absence of bicycle routes. Infrastructure to deal with safety concerns can be expensive and difficult to incorporate in established neighbourhoods. In most cases infrastructure and aesthetic improvements receive attention in areas with the strongest political support.

"We have to have something to live on. Without work, our children are moving away."

The economic viability of many rural communities has declined in the past decade. This is partly due to new generations leaving communities to seek employment in urban settings and partly due to the instability of the primary resource industries upon which most communities have thrived. Some rural areas have become tourist attractions for the way they used to be rather than as viable communities. Some rural areas within commuting distance of large centres are being used as residential areas (bedroom communities).

The following goal for sustainable communities is proposed:

Goal

To improve the form and function of the built environment for community liveability incorporating economic, environmental, health, safety and aesthetic values.

"There should be an emphasis on small communities taking responsibility for their own environment and economies."

Some Recent or Current Initiatives:

Envirotowns is an initiative of the Clean Nova Scotia Foundation. It is a comprehensive community-based approach to caring for the environment. Envirotowns, which is organized in a municipality by a volunteer Envirotowns Task Force and Foundation staff, is designed to activate residents to become involved in environmental improvement projects ranging from recycling, litter abatement, and energy conservation to beautification.

The Outdoor Land Company has developed residential properties in a manner that, in cooperation with new owners, provides for stewardship of the area.

Proposed Initiatives:

11.1 Encourage greater development of existing communities before taking new areas of land for development. Consider park and open space requirements in this process.

11.2 Encourage restoration development for abandoned and deteriorated buildings/areas.

11.3 Establish a program to encourage revitalization and beautification of community neighbourhoods and satellite commercial and industrial development.

11.4 Encourage the establishment of community based volunteer environmental watch committees and neighbourhood beautification and clean-up groups.

11.5 Implement criteria encouraging new settlements according to sustainable development criteria that recognize the environmental needs of the area.

11.6 Incorporate safety and environmental concerns in the development and review of subdivision by-laws as they relate to street layout, design, and construction including pedestrian and bicycle movement.

11.7 Review transportation policies at the provincial and local levels including the following possible measures (Also mentioned in the Energy and Transportation component):

11.8 Develop regional transportation plans;

11.9 Increase the use of public transit;

11.10 Establish express lanes for buses and passenger cars carrying more than two people;

11.11 Provide for the use of existing road systems for bicycle paths;

11.12 Expand programs to support van pools and other ride sharing mechanisms;

11.13 Encourage municipalities with public transit to require that individuals purchase transit passes and display them inside their automobiles in order to park in the downtown core;

11.14 Increase provincial funding for public transport, and reward municipalities for increased transit ridership.

11.15 Encourage cooperation among different forms of public carriers to encourage easy interchange among different transportation modes.

11.16 Establish a target for the reduction and ultimate elimination of the residential use of synthetic pesticides.

11.17 Conduct a review of the percentage of land that is required to be dedicated for park purposes under the Planning Act and determine its effectiveness.

11.18 Develop a set of guidelines to be used in the approval process for land development applications that address land development adjacent to waterways, including cottage development.

11.19 Promote the establishment of community/municipal round tables possibly in conjunction with the already existing economic or industrial development commissions.

11.20 Develop provincial land use policies and encourage all municipalities to develop planning strategies that provide protection of land that has potential for agricultural production. (Also mentioned in Agriculture component)

11.21 Encourage municipalities to incorporate protection mechanisms for viewplanes and aesthetic landscapes into their planning strategies.

Education

In order to integrate economic, social, and environmental goals (sustainable development), many Nova Scotians must change their attitudes. And education is the key to accomplishing this change.

It is clear that the formal school system must be updated across the entire curriculum to reflect this developing ethic. Future graduates must appreciate their dependence on a healthy environment as the basis of economic prosperity and their quality of life.

At present there are many environmentally related education programs. Most of these have been a result of individual initiative and for the most part are uncoordinated, and underdeveloped. These existing Nova Scotia "success stories" in the field of environmental education should be used as models.

Environmental education activities should be holistic and interdisciplinary, examine local and global issues, and enable learners to develop critical thinking and problem-solving skills. Programs should be designed using environmental education models that have proven to be successful.

The following goals are proposed for the education of all Nova Scotians:

Goal 1:

To ensure that all Nova Scotians understand the concept of and the need for sustainable development.

Goal 2:

To dramatically improve the level of sustainable development education for all Nova Scotians so that we are able to critically evaluate issues and take appropriate actions in our own lives.

Some Current Initiatives:

Sunship Earth, an experiential program designed for 10- and 11-year-olds, is offered each summer by the Halifax Recreation Department. The program has been very successful at increasing the level of environmental appreciation of participants.

The Environmental and Sustainable Development Education Subcommittee of the Nova Scotia Round Table is preparing detailed recommendations that would, if implemented, institutionalize sustainable development education in schools and universities.

Community-based environmental groups have initiated education programs particularly in waste education.

Stora Forest Industries held an environmental awareness program for all of its 1200 employees.

The Nova Scotia Teachers' Union and the Department of Education have initiated a Global Education Program.

Dalhousie University has begun an environmental course for M.B.A. students.

Clean Nova Scotia Foundation has designed a recycling curriculum for schools.

Some Nova Scotians already participate in professional organizations such as the North American Association of Environmental Education (NAAEE) and are trying to develop a national network of environmental educators.

National environmental education activities are being studied and developed by the Man and the Biosphere Network (MAB) through UNESCO, the federal Green Plan, the National Round Table on the Environment and the Economy (NRTEE), and the Sustainable Development Education Program (SDEP).

Proposed Initiatives:

12.1 Designate a coordinating agency for provincial environmental education.

12.2 Develop a province-wide environmental education curriculum for incorporation in all subject areas.

12.3 Support the development of a provincial association of environmental educators, both professional and volunteer.

12.4 Develop case studies of successful environmental education programs in the province that can be widely distributed as models.

12.5 Develop environmental awareness and training seminars for members of the Nova Scotia media on critical issues associated with the Sustainable Development Strategy.

12.6 Integrate environmental education into pre-service and in-service teacher training.

12.7 Encourage the inclusion of environment and sustainable development introductory level courses for university students. Ensure that all business and professional courses, including public administration, include the principles and practices of environmental management in decision making.

12.8 Distribute information about effective successful training models for industry and government. Support the development of continuing education programs for various sectors such as agriculture, fisheries, forestry, and public service.

12.9 Encourage businesses and government to establish sustainable development committees as a way of providing ongoing environmental education in the workplace.

12.10 Develop community-based programming in environmental citizenship and values training.

12.11 Develop a province-wide information program to discourage wasteful and environmentally demanding lifestyles.

12.12 Liaise with the National Round Table on the Environment and the Economy (NRTEE), the Sustainable Development Education Program (SDEP), and the Green Plan to provide input and assistance in developing programs for use in Nova Scotia.

12.13 Liaise with and support national (Man and the Biosphere: MAB) and international environmental education efforts developed by UNESCO and the United Nations Environment Program (UNEP).

12.14 Develop and maintain a provincial environmental education resource directory and make it accessible to the public.

12.15 Encourage the development and use of compatible information technology as a vehicle for improvements in education and as a basis for decision making.

Environmental Management and Decision Making

People make decisions every day at work and at home that affect the economy and the environment. In order to successfully implement sustainable development, every Nova Scotian must learn to incorporate the concept into decision making.

The responsibility for moving to a sustainable society does not belong only to government. All institutions including government, business, the media, community and environmental groups, and individuals must become involved.

Jurisdiction and Regulation

When the Fathers of Confederation divided the powers among the levels of government of a new nation, environmental protection was not a major concern. As a result, the governmental responsibility for sustainable development or environmental matters is not clear. Nor do ecosystems, our natural resources,

or environmental problems respect political boundaries. Our rivers and air cross municipal, provincial, and international boundaries without concern for the changes in jurisdiction across each boundary.

"Sustainable development is not viable in the current economic climate; if it was, government influence would not be required to get it started."

Laws and regulations are important instruments of government. In the last few years Nova Scotia has introduced new laws and regulations in the environmental field designed to protect the environment. The right to a clean environment is implied in the principles of this strategy. It is important that the right to a clean, healthy environment be established in balance with economic development and employment. The concept of an environmental bill of rights and responsibilities, including the use of a public trust doctrine, and a broadening of existing causes of action and rules of standing before the courts are examples of ways that the legal system can reinforce the concepts and principles for sustainable development as outlined in this strategy.

A discussion paper on environmental law enforcement was released for public discussion during the summer of 1991. While these changes are important, the enforcement of regulations and laws is costly to society and is not always the best way to bring about change because enforcement tends to promote retroactive responses rather than proactive decision making.

"Cooperation among all levels of government, including with our New England neighbours, is absolutely necessary if sustainable development is to be realized in this region."

At present there is much duplication in environmental legislation (both federal and provincial). This causes many delays in the approval process. Therefore, environmental legislation should be consolidated.

Governments will need to work cooperatively if we are going to meet the goals of sustainable development. Municipalities, provincial governments, the federal government and our neighbours in New England must not act in isolation.

Both federal and provincial governments have significant powers and responsibilities in the environmental field. At present municipal governments have limited powers under the Planning Act to deal with environmental matters. These powers should be clarified and/or expanded to enable municipalities to include a wide range of environmental considerations in municipal planning.

Municipal governments should be encouraged to establish Round Tables on the Environment and Economy so that communities at the local level can address issues of economic development, regional cooperation, and environmental enhancement and protection.

The Government of Nova Scotia should encourage inter-municipal watershed planning groups across the province.

The Government of Nova Scotia should enact legislation that protects people who are helping to ensure environmental compliance (e.g., workers who "blow the whistle" on their companies' violations, environmental watch programs).

Institutions and Policy Formulation

Every institution in the province, whether government or private, makes decisions every day that have an impact on our environment and our economy. A family decision to compost kitchen wastes can be as important as a government policy to encourage recycling. The decision by a company to change the manufacture of a product to cut down on waste or the decision of a school board to fund an energy conservation program can both contribute to a more efficient and competitive society. It is essential that decision-making bodies in all our institutions, both public and private, consider the environment and the economy and incorporate the principles of sustainable development in every decision that is made.

Government, as one of the largest and most influential of our institutions, must set an example. Government should also provide services to small business to conduct environmental audits of their operations.

Public involvement in decisions involving legislation and regulations, policies, programs, and projects is essential. Effective public consultation should therefore become a routine part of the government decision-making process. A government mechanism to coordinate consultations and to assist in designing them to be effective is increasingly necessary. Early public consultation is especially important where changes may affect the ability of persons to earn their livelihood.

"There are at present significant difficulties which result from overlapping and in some instances, conflicting jurisdictional issues involving the federal and provincial governments."

All new legislation, regulations, policies, and operational activities should receive an automatic evaluation of their environmental and economic consequences.

Many existing government policies and operations were begun at a time when there was little concern for the environment. An office modelled on that of the auditor general should be established to evaluate the environmental and economic consequences of existing policies and operations of government departments. Government funded institutions should be asked to undertake an environmental

audit of their activities by independent experts. Every government department should be held accountable for helping to meet the goals of sustainable development. Business and public institutions outside government should be provided with assistance for environmental audits of their activities.

Government purchasing policies should be revised to favour environmentally friendly products.

The organization of government departments has grown up over time and has not always taken into account the requirements of sustainable development. The provincial government should review the organization and mandate of government departments to reflect the adoption of sustainable development. It should also take steps to eliminate duplication of effort within government and to simplify approval processes.

Environmental Planning

It is easier, and less expensive, to plan ahead to avoid environmental problems than to clean up afterward. Changes in municipal planning powers, and the consideration of environmental effects while policy and operational decisions are made are critical to environmental planning in advance.

Monitoring Progress

In most human activities we look for measuring sticks to gauge how we are doing. Are we making progress, slipping behind, or standing still? The recent or current initiatives included in this paper are evidence of activity and change in the right direction. But are they having a measurable effect? There have also been a number of studies by national agencies that discuss how Nova Scotia compares to the rest of Canada. But what is really important is seeing the actual results in our environment and our economy.

The federal government has published one State of the Environment Report and work is ongoing to refine the techniques for measuring progress on environmental quality and toward the goal of sustainable development.

Nova Scotia should develop ongoing state-of-the-environment reporting with emphasis on information that is useful in monitoring progress on sustainable development. The focus should be on indicators of key dimensions of environ-

mental quality and the economic and other human activities that have important environmental implications. To begin the discussion, five possible indicators are suggested:

- energy use per capita and per unit of production.
- waste per capita and per unit of production.
- per centage of land protected.
- water use per capita.
- shellfish closures.

These five measurements would not be all-encompassing but would give us an indication of our progress on important issues that demonstrate our ability to improve our economy and our environment.

Implementing Nova Scotia's Sustainable Development Strategy

A strategy can set goals, outline fundamental principles, and suggest actions that can be taken. Changing the way we make decisions about our environment and economy, putting the words into action, is up to all of us. Government must play a leadership role. But individuals, businesses, institutions—both private and public—and governments will have to work together in partnership to achieve the goals set out in this strategy.

"The strategy should clearly identify follow-through in terms of implementation, particularly in regards to efforts to effect and/or influence change toward a more fully integrated approach to the environment and the economy."

As the strategy indicates, many initiatives are already under way. Many of the initiatives from government cross departmental responsibilities and will require coordination. A central agency of the government, for example the Policy Board, should be given the responsibility of implementing the strategy and coordinating the activities of government departments. This should include the preparation of a plan and schedule of implementation. Public reports on progress should be made annually to the Round Table on Environment and Economy. And the Round Table should undertake a formal review of progress each year and make public its conclusions.

A sustainable development strategy should not be a static document. New information and changes in our environment and our economy will require amendments to the strategy. Actions taken may not have the desired results or might exceed expectations. The Round Table must include in its annual review recommendations for change to the strategy.

Appendix I

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Appendix II

Members of the Nova Scotia Round Table on Environment and Economy

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Premier of Nova Scotia (Co-chair)

Hon. John G. Leefe,
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Susan Holtz, Environmental Consultant (Vice-chair)

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National Research Council

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Logan Drilling Limited

John P. Vissers, Former President,
Nova Scotia Federation of Agriculture

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Murray Coolican,
The Outdoor Land Company

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Hon. George Archibald, Minister,
Nova Scotia Department of Agriculture and Marketing

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Kathryn Heckman,
Lawyer and Planner

Dennis Grant, Union Rep—Canadian Paperworkers

Colin Stewart,
Nova Scotia Federation of Naturalists

Alan Chaddock, Artist

Dr. Ruth Schneider, Coordinator,
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University College of Cape Breton

Daniel N. Paul, Chief,
Confederacy of Mainland MicMacs

Christopher Clarke,
Bowater Mersey Paper Co. Limited

Robert P. Radchuck,
Peat Marwick Thorne

Lisa Mitchell,
Atlantic Youth Coalition on Environment and Development

Appendix III

Glossary

Acid rain:
Rain water that has been contaminated with chemicals introduced into the atmosphere through industrial, automobile, and other emissions causing the acidity to be increased from that of unaffected water.

Ballast water:
Water taken on by a ship used to improve stability.

Buffer zone:
An area between two other areas designed to reduce the effects of one on the other.

Clearcutting:
The harvesting of all merchantable trees from an area of forested land.

CO_2:
Carbon dioxide

Conservation easement:
A means of limiting what can be done on a property.

Cut block size and configuration:
Refers to the size and shape of the area of forest harvested in a forestry operation or otherwise treated as part of a silviculture operation.

Ecoregion:
Geographic region where the ecosystems are substantially different from adjacent regions.

Ecosystem:
A community of interacting organisms, including the non-living components on which they depend.

Genetic variation:
Differences in the genetic code contained in individuals whether resulting in detectable differences or not. These differences contribute to a species ability to adapt to environmental change.

Global warming:
Unnatural warming of the earth's surface as a result of increases in greenhouse gases in the earth's atmosphere.

Greenhouse gases:
There are five primary greenhouse gases. These are carbon dioxide, methane, chlorofluorocarbons, nitrous oxides and ground level ozone.

Habitat:
The home of a plant or animal, usually in the sense of a relatively uniform association of species such as a bog or a seashore.

High-grading:
A partial harvest removing only the most valuable species or trees of desirable quality without regard for the condition of the residual stand.

Landscape management approach (forestry):
Refers to the inclusion of aesthetic considerations in the planning and carrying out of forest management operations with due regard for relief, topography, and other physical characteristics.

Lead agency:
An agency with responsibility for the coordination of activities of all other agencies with related interests and mandates.

NOx:
Nitrous oxides

Offsetting credits:
Refers to a method of controlling greenhouse gas emissions where any man-made increase or decrease in emission will be measured and calculated as debits or credits from an established starting point. When debits equal credits over a sustained period, stabilization of man-made gases is achieved.

Old-growth forest:
A stand of mature or overmature trees relatively uninfluenced by human activity.

Ozone layer:
A layer of gases contained in the stratosphere that protects us from the harmful rays of the sun. The ozone layer absorbs the sun's ultraviolet rays, which can cause skin cancer, reduce crop yields, and damage aquatic life.

Patch cutting:
A form of clearcutting emphasizing smaller cleared areas. Adjacent areas are cut years later, resulting in a patchwork of different aged stands.

Selection cutting:
The removal of some trees in all size classes either singly or in small groups or strips.

Selective cutting:
A type of exploitation cutting that removes only certain species (a) above a certain size, (b) of high value. Known silviculture requirements and/or sustained yields are wholly or largely ignored or found impossible to fulfill.

Shelterwood cutting:
Any regeneration cutting in a more or less regular and mature crop, designed to establish a new crop under the protection (overhead or side) of the old, as typically in shelterwood systems, or where the resulting crop will be more or less regular.

Synthetic pesticide:
A product manufactured through chemical synthesis that is used to kill pests such as insects, rodents, and weeds.

VOC:
Volatile organic carbon

Watershed:
The area drained by, or contributing water to, a stream, lake, or other body of water.

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